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"Planned Benefits" Can Be Misleading in Digital Transformation Projects: Insights From a Case Study of Human Resource Information Systems Implementation in Healthcare

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Abstract

Human Resources Information Systems (HRIS) are being implemented in many organizations but, like other technology projects, translating their potential benefits into meaningful improvements can be challenging. So-called "planned benefits" approaches are designed to aid this translation, but little is known about their success in HRIS projects. This study examined how a planned benefits approach was manifested in a national-scale HRIS implementation program. The results point to the importance of reviewing the benefits plan at regular intervals, to ensure the project can adapt to changing circumstances, and considering benefits at the level of individual modules and user groups, as well as for the organization as a whole. Adequate data preparation, training, effective communication, and process analysis were identified as key actions necessary for successful HRIS implementation and benefit realization.

Keywords

human resources for health, human resource information systems, business systems, benefits realization, case study

Introduction

Strategic workforce planning and the development of research-informed policies on human resources (HR) have proven difficult in the health sector. Often, this is because systems for recording and updating health worker numbers are very limited (J. Campbell et al., 2013). As a result, the exact size of the national workforce remains a mystery both in developing and developed economies. In the United Kingdom, for example, estimates of the total National Health Service (NHS) workforce varies between 1.3 and 1.7 million people, depending on the source (D. Campbell & Duncan, 2016; Nuffield Trust, 2017).

Although the health care information technology (IT) sector was historically driven by administrative requirements such as billing and ordering, in recent years its focus shifted toward clinical information systems (IS). This shift reflects a realization in health care of the value of electronic health records (EHRs) and clinical decision support tools for improving health care quality, safety, efficiency and outcomes, leading to major government incentives schemes focused on EHR implementation, notably in the United States (Simborg et al., 2013). This shift toward clinical IS is evident in both the eHealth strategies developed by many governments and in the international academic research literature. In contrast with clinical IS, Human Resource Information Systems (HRIS), which support the management and development practices of HR throughout the employee life cycle, have received little attention (Tursunbayeva et al., 2016). For example, as recently as 2018, only around 40% of organizations had a regularly updated enterprise HR systems strategy in place (Harris & Spencer, 2018).

Despite the limited research attention paid to HRIS, their importance for enabling health workforce management and analytics is being recognized by governments in many countries (World Health Assembly, 60, 2007; World Health

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Organization, 2016). This increased recognition has led to ambitious investments in HRIS internationally. For example, in the United Kingdom in 2006 the NHS in England and Wales started embarking on one of the largest scale IT roll outs in the world, involving the implementation of a commercial electronic staff record across 150 sites in the public health sector (Digital Health, 2006). In some developing countries, where governments or individual health organizations are unable to support the financial cost associated with HRIS procurement and implementation, help comes from open source systems financed by international sponsors, such as the U.S. Agency for International Development, which supported the CapacityPlus Program lead by IntraHealth International in more than 20 countries (CapacityPlus, 2015).

Despite their potential benefits, national HRIS implementation projects in health organizations have proven challenging. An extreme example is the implementation of a payroll and rostering system in Queensland Health which came to be labeled "the largest admitted IT project failure in the Southern Hemisphere" costing AUD$1.25 billion (Eden & Sedera, 2014). As with clinical IS, HRIS implementation is affected by a range of socio-technical challenges (Tursunbayeva, 2018). These challenges often hamper the benefits realization processes, with many expected improvements either not being realized or only partially so. Despite the prevalence of these challenges, a systematic literature review found that research on HRIS in health care tends to consider *either* expected benefits *or* achieved outcomes (Tursunbayeva et al., 2016) with the processes involved in transforming expectations into benefits remaining relatively unstudied, echoing research on other types of IS (Shang & Seddon, 2002). As such, we know little about the extent to which the expected benefits of HRIS are actually realized in practice and the actions that can accompany their realization in the context of health care. The study described in this article addresses this research gap and responds to broader calls for interdisciplinary and global research on HRIS impacts in health care, to strengthen evidence-based practice in this area (Riley et al., 2012).

The section that follows summarizes relevant literature in project management and IT benefit realization, followed by a short section detailing the research questions that follow from this review and which we investigate in this study. The research setting, methodology, and findings are described next, followed by an analysis and interpretation of the results. The article concludes with a discussion of the study's implications and recommendations for future research and practice.

Literature Review

Research on project management and implementation has provided valuable insights and guidance on how IT projects can be better delivered in terms of their scope, cost, or time. However, this research provides far less insight about how such projects can meet their expected benefits (Zwikael et al., 2018). Benefits realization is often defined in such research as "the process of organizing and managing, such that the potential benefits arising from the use of IT are actually realized" (Ward & Daniel, 2006, p. 384). This should include identifying the expected benefits, planning a benefits realization strategy, executing the benefits realization plan, reviewing and evaluating results, and identifying potential further benefits (Ward & Daniel, 2006). Using formal benefit realization programs has been promoted by academics and practitioners as a means of increasing the success of digital transformation projects (e.g., Einhorn et al., 2019; Ward & Elvin, 1999). Despite this, they are often used to illustrate gaps between management theory and practice (Pfeffer & Sutton, 2000), or to give organizations the appearance of control, without meaningfully demonstrating whether or how the introduced changes affect behavior and outcomes. Although studies aiming to understand the practices contributing to successful benefits realization in IT projects exist (e.g., Zwikael et al., 2019), they tend to be generic, both in terms of the industry and technology applications, and may obscure critical differences across sectors and applications. As such, relatively little is known about whether and how public health organizations incorporate a benefits realization approach when selecting a new HRIS.

Benefits associated with IT implementation projects can be classified into two groups: (a) expected benefits—"benefits set prior to project commencement which the project funder seeks through an investment in a project" (Zwikael et al., 2018, p. 650) and (b) realized benefits—benefits attained from the project. Although distinct from realized benefits, expected benefits can play an important role in shaping their realization. According to the Project Management Institute (2016), 74% of organizations that set expected benefits achieve them, compared with 48% of organizations that do not. Previous research has revealed diverse expected and realized benefits from IT. These include direct benefits, such as cost reductions due to automation, indirect benefits, such as improved flexibility due to changes in current processes, and strategic benefits, such as those arising from improvements in relationships with external partners (Bunduchi & Smart, 2010). However, a recent systematic literature review on HRIS in health found that research on HRIS tends to consider *either* only their expected benefits *or* achieved outcomes (Tursunbayeva et al., 2016), with the processes in between remaining relatively unstudied, echoing research on other types of IS (Shang & Seddon, 2002). As a consequence, evidence on the expected and realized benefits of the HRIS, as well as on how the translation of benefits from expectation to realization can be punctuated by specific actions, is still scarce.

Research Questions

Mindful of the aforementioned evidence gaps, concerning the approach to incorporate benefits realization in the

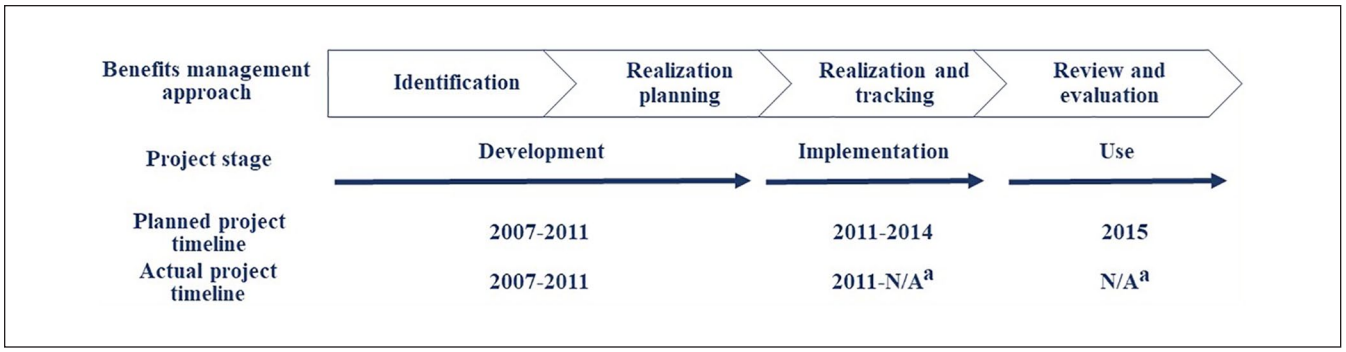

Figure 1. Planned benefits management approach.
[a]At the time of our data collection (2015) the project was still in progress, and none of the respondents reported that the final review and evaluation had been initiated.

implementation of HRIS, the content of these benefits, and the actions involved in their incorporation, the objective of this study is to examine the benefits associated with the implementation of a HRIS in a health care organization. The specific research questions set were as follows:

> **Research Question 1 (RQ1):** How did a large public sector health organization incorporate benefits realization approaches when choosing a new HRIS?
> **Research Question 2 (RQ2):** What were the expected and realized benefits of the HRIS implementation?
> **Research Question 3 (RQ3):** How was the translation of benefits from expectation to realization punctuated by specific actions?

To address these research questions, we have studied an HRIS implementation in the public health sector of one European Country.

Method

Research Setting

The case study examined an ongoing HRIS project involving the procurement and implementation of a multi-module, off the shelf HRIS across a nationwide, public National Health Organization (NHO) in a small European country. The project was driven by a new government digital agenda for integration of services across the NHO and mimicked a similar nationwide project taking place in a neighboring country. It was initially scheduled to take place between 2011 and 2014, although it was still in progress at the time of our data collection (2015). Individual Regional Health Organizations (RHOs; n = ca. 20) took responsibility for rolling out HRIS within the health care organizations under their jurisdiction, for setting up local project teams, and for choosing the implementation approach.

The strategy developed by the project's leaders mapped four stages of benefits management against three stages of the project life cycle (Kappelman & McLean, 1994). These benefits management stages tied the delivery of benefits to the different project activities carried out at each stage, including project development (e.g., included project initiation and project planning related activities, as well as creation of HRIS specification, business case and HRIS procurement), project implementation (e.g., HRIS testing, roll out, and additional pilot testing), and HRIS use (see Figure 1).

Data Collection and Analysis

This research followed a qualitative embedded case study approach (Yin, 2003) to gather rich contextualized data. As our research questions partly involved reconstruction of the HRIS project's history, the data were collected from extensive project documentation including business case proposals, consulting company reports, national and individual RHO implementation plans, lessons learned report, and project training materials. The documents were shared with us by the national and/or local project implementation teams.

We also conducted semi-structured interviews with 31 key project stakeholders selected based on their knowledge and involvement with the project during the course of its life cycle. These included respondents from eight (out of ca. 20) selected RHOs, that is, Senior HR Executives (n = 7), HR Professionals (n = 9), HRIS team members (n = 4), project manager (n = 1), line manager (n = 1) and employee (n = 1), members of the national project team (n = 3), representatives of the Government eHealth department (n = 1), the procurement team (n = 1), the vendor (n = 2), and the system supplier company (n = 1). Overall, 19 individual and six group interviews were carried out with these stakeholders. The interviews with such a variety of stakeholders helped to triangulate data obtained from multiple informants. Each interview lasted an average 50 min and were recorded and transcribed verbatim.

Data analysis included three main steps and relied on the NVivo qualitative analysis software. The first stage of data analysis involved *open coding* in NVivo of project documentation and transcripts to identify categories of expected and

Table 1. Benefit Score by Procurement Options Considered.

Benefit category	Weight (%)	1. Do minimum	2. Link HR element of the HRIS adopted in a neighboring country to national payroll system	3. Implement full HRIS (including payroll system) adopted in a neighboring country	4. Procure different HRIS and link it to national payroll system
Management information	20	2.0	4.3	4.7	4.3
Service and workforce planning	16.7	1.3	3.0	3.3	3.0
Employee benefits	10	2.3	3.3	3.3	3.3
Efficiency	25	1.7	3.7	4.7	3.7
Improved business processes	28.3	2.0	3.7	4.7	3.7
Total weighted score	(100)	185	367	433	367

Note. Adopted from the project business case. HR = human resources; HRIS = Human Resources Information Systems.

realized benefits, as well as specific actions identified as necessary to achieve them. The second stage involved *interpreting and mapping these broad categories of benefits* in NVivo *into theoretically informed categories* related to HRIS *Expected Benefits* and *Outcomes.* This analysis was informed by Parry and Tyson's (2008) HRIS benefits framework, which distinguishes the following categories of benefit associated with HRIS implementation: improvements in operational efficiency, strategic orientation, service delivery or organizational image, empowerment of managers and employees, and standardization of HR processes, systems, or data (Parry & Tyson, 2008). This framework was enriched with two additional categories of expected benefits identified in the aforementioned systematic literature review of HRIS in health: supporting macro organizational changes, and compliance with regulatory requirements, and with four categories of realized benefits, including improvement in patient care, compliance with regulatory requirements, generation of interest from other countries, and improved IT infrastructure (see Tursunbayeva et al., 2016, for discussion). Data that appeared not to fit to any of the aforementioned benefit categories and data on actions important for benefits realization were grouped separately, according to the categories that emerged from our analysis.

Ethical Approval

The NHO, RHO, and all study participants are anonymized in this article, as per their request, and as described in the ethics approval obtained for this study from the University of Edinburgh on July 20, 2015.

Findings

How the Benefits Realization Approach Was Incorporated During the Selection of an HRIS Solution in a Large Public Sector Health Organization (RQ1)

The process of identifying benefits started in the project development phase, during the initial building of the business case for HRIS procurement when a central government team created "user reference groups." These groups were tasked with identifying the technical requirements for the HRIS, the expected benefits of its different functionalities, as well as implications of these benefits for HR Management processes. At the outset, these reference groups mainly included HR representatives from the RHOs, although other staff were engaged over time. A shared framework articulating the various benefits expected from implementing an HRIS was developed based on the inputs from these user groups (see Table 1). These benefits were weighted against the four HRIS procurement options: (1) *Do the minimum*, that is, upgrade the existing HRIS and/or invest in new modular HRIS functionalities at the local level; (2) *Purchase only the HR element of the HRIS suite adopted in the neighboring country and link this to the existing national payroll system*; (3) *Implement the full HRIS suite adopted in the neighboring country, including the payroll system*; and (4) *Procure a new/different HRIS and link it with the existing national payroll system*. A comprehensive review of the supplier market was conducted with the help of an external consulting company. The project team also appraised the secondary economic and financial risks and benefits of each option. The latter focused on risks involving supplier and vendor relationships, financial and HR for implementation, technical and functionality capabilities of the new HRIS, the project execution approach, data migration and security issues, and processes and the effect of the new HRIS on existing HR procedures.

After completing these exercises, the final version of the benefits framework included categories for management information, service and workforce planning, employee benefits, efficiency, and business processes. A weighting and scoring exercise was then undertaken, during a workshop with the user reference groups, to discuss and rank each option in terms of its nonfinancial benefits. The rubric for scoring the relative benefits of the different procurement options, relative to the status quo, included the categories: (1) no change in benefit (e.g., if do minimum option will be chosen) (1 point); (2) marginal increase in benefit (2 points); (3) small increase in benefit (3 points); (4) moderate increase

in benefit (4 points); and (5) large increase in benefit (5 points). User reference groups also weighted each benefit category according to their perceived importance, using a scale of 0 to 100, from least to most important.

Among the four procurement options considered, being able to link the new HRIS with the existing national payroll system (Option 4) was favored by the user groups and the national project team. A key reason for choosing Option 4 was that it had a lower cost, and the existing national payroll system had proven reliable and could ensure uninterruptible payroll service to staff.

It was planned that benefits realization and tracking (against the original expectations) would be undertaken by the individual RHO implementation teams, at key stages throughout the duration of the project. The central team was supposed to set out specific timescales for achieving each benefits category and to monitor their achievement together with the leads responsible for their delivery.

It was intended that a more complex benefits review and evaluation exercise would be conducted following national HRIS implementation and its integration with the national payroll system (which was still ongoing at the time of data collection), to compare the realized benefits with those initially envisioned. Specific measures were proposed to carry out this assessment such as conducting surveys or quality controls. However, at the time of our study in 2015, the national-scale (post implementation) evaluation had not yet been initiated.

Expected and Realized Benefits of the HRIS (RQ2)

After selecting on Option 4, the categories of benefit previously outlined (Table 1) were slightly adjusted to reflect the chosen HRIS functionality (Table 2). Most of the expected benefits were related to the workforce data/reports the new HRIS would provide to various stakeholders (primarily the Government).

Strategic and patient care benefits (1.1., 1.2., 3.1., and 4.2.). A key benefit category expected at the project development stage was improvement of *workforce planning* and management efforts at the local, regional, and national levels. It was envisaged, for example, that data on staff age, skills, contract terms and conditions, and open vacancies would enable RHOs to ensure their workforce is fit for purpose. It was also expected that the data would enhance recruitment and succession planning, facilitate more effective deployment of staff, and inform knowledge-based decision-making and patient care delivery and safety. Meanwhile, the provision of sickness and absence information directly to line managers was expected to facilitate a more effective *staff governance*. In particular, it was expected that monitoring and management of absences could help the organization to meet government targets while also improving employees' health and well-being. The respondents did not refer to Strategic or Patient care–related benefits at this stage.

Service delivery and empowerment (2.1.). The system had been expected to improve the accuracy and relevance of *workforce information*, to enhance reporting and to enable managers and employees to access the data via a new self-service module. It was thought that this would support managers by providing them with direct access to information on their teams. It was also expected that self-service would help employees to check/update their employment information and to make HR requests (e.g., annual leave requests). The new system was also expected to enable the exchange of HR-relevant information between business functions, and between RHOs, thus easing personnel transfers.

Our results suggest that the new HRIS did indeed contain better quality information. Some HR managers reported that they benefited from the workforce reports that they could generate from the system, such as employees' contract expiration dates, enabling better workforce planning in their RHOs.

Operational efficiency and standardization (2.2.). The new HRIS was intended to replace most pre-existing HR systems, thus standardizing HR data fields across all individual RHOs, and leading to a single format for workforce reports the RHOs provided to the Government.

Having one national system was also expected to reduce the burden of manual data entry and automate the preparation and submission of some national reports. Electronic transfer of information between HR teams was envisioned to reduce paper consumption and to increase the accuracy of staff payments.

The HR professionals we interviewed reported that using the system had simplified and accelerated certain HR processes by reducing bureaucracy, streamlining approvals, and standardizing some minor HR tasks (e.g., posting job announcements in a unified format). Interviewees reported that the main benefit arising from the system came about through the sharing of information and dialogue between different RHOs, which was associated both with the experience of implementation and through having greater access to data. RHOs reported that this dialogue had led them to reconsider their operating procedures and triggered an opportunity to begin standardizing previously heterogeneous and inconsistent HR practices. The dialogue was also considered as a first step toward the creation of shared HR services across RHOs.

Compliance (3.2. and 4.1.). Interview participants perceived that the system would enable RHOs to more easily comply with diversity and equality reporting requirements, helping to improve their inclusiveness and identify and mitigate potential discriminatory risks that might present legal challenges. However, our findings did not reveal any evidence that these compliance-related benefits were realized at the time of data collection.

Table 2. Expected and Realized Benefits, and Actions for Benefits Realization.[a]

Expected benefits[a]	Benefit description[b]	Benefit/s reported as realized	Benefit categorization[c]	Actions for the benefits realization[d]
1. Workforce planning	1.1. Effective management of staff, resources, and service delivery	—	Strategic	Processes Training Communication
	1.2. Better delivery of service change through budget management and control	—	Strategic and Patient care	Processes Training
2. Workforce information	2.1. Improved quality and management of data including more robust access control and audit	✓	Service delivery Empowerment	Processes Training communication Data preparation
	2.2. Business processes' increased effectiveness and efficiency, standardization, and consistency	✓	Operational and Standardization	Processes Training
3. Staff governance	3.1. More effective sickness absence monitoring and management	—	Strategic	Processes Training
	3.2. Better governance including compliance with the Equality Act	—	Compliance	Processes
4. Legislation	4.1. Reduced risk of legal challenge potentially arising from organizational failure to meet equalities requirements	—	Compliance	Communication
	4.2. Patient safety	—	Patient care	N/A

[a]Adopted from the project business case. [b]Benefit categories and description as articulated by the project's founders. [c]Benefits grouped into theoretically informed categories (Parry & Tyson, 2008; Tursunbayeva et al., 2016). [d]Actions grouped into the categories that emerged from our analysis.

Actions Identified as Necessary for Project Realization and Consequently for Benefits Realization (RQ3)

In the business case produced by the national project team in collaboration with RHO stakeholders at the project development stage, specific actions were identified as being necessary for project realization, and consequently to achieve expected benefits (see Table 2). Although these actions were not explicitly prioritized, some were mentioned more often in the project business case. In order of prominence (from highest to lowest), these actions involved (a) the *analysis of* new *processes* or changes to existing processes, which would be needed prior to rolling out the system and/or reviewed throughout its implementation; (b) the development of *training* materials and delivery of appropriate training sessions to the project stakeholders and future system users prior to the implementation and/or phased throughout the implementation; (c) the development of an effective *communication* and engagement strategy with the project stakeholders and project users prior to the system roll out; and (d) the *preparation of data* including data cleaning to be executed prior to the system implementation. It was the intention to undertake these actions prior to and throughout the implementation. However, the feedback from our respondents indicates that the project faced significant financial and HR constraints that altered its initial scope, as well as technical/functionality issues that appeared during its life cycle and discouraged diverse RHOs to engage in or to delay their ongoing implementations. According to the interviewees, the RHOs had only undertaken some of these actions at the time of the study. This was consistent with the findings outlined in a "lessons learned" report from a pilot with three selected RHOs, aimed at identifying technical/functionality issues that could hinder success. The actions identified as necessary for project realization and consequently for benefits realization are discussed in detail below.

Processes analysis. Changes to local HR Processes were not fully assessed or agreed prior to the system rollout within individual RHOs and by all RHOs together, despite this being a strong recommendation of the "lessons learned" report for the remaining implementation sites. Discussing and agreeing on these processes during the HRIS implementation often resulted in changes to the functional scope of the HRIS or to system reconfigurations that affected the project timeline.

In order to increase user acceptance of the system, the "lessons learned" report recommended only rolling out certain modules to HR teams in the first instance, to give them time to familiarize themselves with the system before its rollout to a larger audience. However, our findings revealed that the decision about which implementation strategy to follow was initially left to RHOs, who were charged with local implementation, resulting in variable practices that depend on the organizations' size or prior experience with HRIS.

Training. Guidance for the initial system rollout came primarily from National HRIS User Training Manuals developed by the busy national project team, alongside its implementation

activities, and lacked practical guidance on how to perform transactions in the system. Despite the lessons-learned report highlighting training as integral to achieving system buy-in, initially some users reported difficulties in locating training materials. Training sessions were organized in addition to distributing the manuals; however, these took place well before the system was implemented in many RHOs, and only with selected RHOs representatives, who were supposed to train other users locally. When the system was received by diverse RHOs, those who had participated had forgotten much of what they had learned.

Communication. Effective communication was specified as a key requirement for benefits realization in the project business case. This included having a strategy for keeping local workforce planners updated on the project's progress and promoting the system and its benefits to the wider workforce, as well as enhancing the uptake of specific modules identified as a critical. Although the national project team was identified as responsible for communication with and between RHOs, individual RHOs were asked to create local communication strategies with HR departments and all employees. The "lessons learned" report indicated that email was the main communication channel used during the HRIS roll out, with additional face-to-face communication for delivering key messages about the system or promoting certain modules.

Data preparation. A significant challenge faced by the HRIS project was data migration between existing systems and the new HRIS. Respondents mentioned that the quality of data in some RHOs was poor and, as such, the RHOs were not ready for migration. HR professionals, who were mostly responsible for local system rollout, had to do this in addition to their other daily tasks, and faced challenges in populating the technical spreadsheets required for data migration. Smaller RHOs managed to complete these manually, while larger RHOs who planned to do automatic data extraction from their preexisting HRIS struggled to do so. Overall, the data migration process was smoother in RHOs with technically skilled workforce analysts. Physical data migration from the spreadsheets into the new system also took longer than expected (in some cases several months), such that when the data were actually uploaded, they were already outdated. The data catch up process was in progress in almost all RHOs at the time of our data collection, with only one RHO having fully uploaded data into the new system. These challenges with data migration significantly delayed HRIS implementation in all RHOs, which as a result affected the process of benefits realization.

Discussion

Our findings indicate that at the outset, the benefits realization approach was carefully planned, following a similar flow to the one described by Ward and Daniel (2006). The project also had a risk management plan, which is in line with some practitioners' recommendation to see the benefits realization plan and risk management plan as mutually dependent (e.g., Philips & Foulds, 2014).

We found that all the categories of HRIS benefit described in Parry and Tyson's (2008) framework were expected from this project, although in this case the categories were interlinked—*Strategic With Patient Care Benefits; Service Delivery With Empowerment*; and *Operational Efficiency With Standardization*. As such, we recommend that future HRIS research and implementation projects not only seek to identify expected and realized benefits, but also consider how different types of benefit may be related. An additional benefit category of *Compliance*, identified in a systematic literature review on HRIS in health, also emerged in this case study (Tursunbayeva et al., 2016).

Previous work has called for benefits to be continuously revisited during lengthy IT projects, so that adjustments can be made if necessary (e.g., Rekenkamer, 2007). In contrast, our data indicate that in this project, the strategic priorities remained unchanged throughout the process, despite changes to the functional scope of the HRIS. This may go some way toward explaining why many of the expected benefits were not realized.

The original benefits realization plan was also founded on the assumption that all new HRIS modules would be used across all RHOs. However, our findings indicate that this was not the case; with some RHOs deriving benefits from modules that were not used across the entire NHO.

We therefore recommended that future HRIS projects in complex organizations consider benefits not only at the level of the IT system as a whole, but also at the level of individual modules and user groups, as these systems can be used by a wide variety of stakeholders in health organizations (e.g., Tursunbayeva et al., 2016). This is also because in national-scale projects involving multiple implementation sites, readiness to adopt IS (Dilu et al., 2017), as well as strategies adopted for their implementation (as was the case in this project) can vary widely. For example, some RHOs already had experience with similar modules, while for others they were entirely new. Local IT maturity will affect how teams prioritize different components of a multicomponent project, as they seek first to fill gaps in provision, as well as to reconcile new with existing systems.

Despite a myriad of frameworks for examining the factors that influence the adoption of technologies in organizations (e.g., TOE by DePietro et al. (1990); Kwon and Zmud's (1987) categories), and specifically the factors influencing eHealth adoption (e.g., Hossain et al., 2019), little is known of the actions that can affect the transformation of expected into realized benefits in HRIS projects. Like previous research, our study has identified some of the resource-related and technical barriers to project success. However,

the results of our study suggest that four actions can be particularly important for successful HRIS projects in health organizations, including *Data preparation, Training, Communication*, and analysis of *Processes.* We thus recommend including such actions as part of risk management and benefits realization plans for future HRIS projects in health settings.

Conclusion

This study is one of the first to describe a benefits realization plan of a nationwide HRIS implementation program in health care, some of the specific actions that may be needed for success and barriers that can prevent the execution of these actions.

It illustrates that the benefits realization process in nationwide IT projects can take time and while some benefits will be realized, others may not be. It also shows that learning can be drawn from both situations and reveals some of the actions that may be necessary to facilitate the translation of expected HRIS projects into reality in the health care setting.

This is one of the few studies focused on a nationwide HRIS implementation in a high-income country. Most such studies (for an exception, see Eden & Sedera, 2014) have taken place in lower and middle income regions (e.g., Driessen et al., 2015).

As with any research, our case study also has some limitations. It was initially planned that the study would be able to observe the completed rollout of the HRIS, but project delays meant that implementation was still underway as the study ended. The findings therefore reflect the benefits realization process during the implementation phase.

Nevertheless, this study has generated valuable insights which have important implications for research, policy, and practice. We empirically verified the applicability of a theoretically informed HRIS benefits framework to the health sector, as well as proposed actions that can be of specific importance for ensuring HRIS project success and benefits realization in health organizations. For practitioners implementing HRIS, or considering whether to do so, the results of this study also offer a guide as to the type of benefits they should expect (e.g., Chalutz & Ben-Gal, 2019) and how to maximize these. For policymakers, the findings offer insights into the types of benefits HRIS projects may bring to national public sector health organizations (e.g., Were et al., 2019), which may be useful for planning future digital investments.

Further research is needed to determine whether these findings are also seen in other HRIS implementation projects in health care and to test the generalizability of the identified actions to HRIS projects in health care and other sectors. Such research will address the call for more empirical studies on benefits realization in public sector IT projects and help to develop more comprehensive benefits scoring approaches. We therefore recommend new interdisciplinary research to study the transformational change process during HRIS implementation in different health care settings and systems, as well as to evaluate systems' return on investment and organizational outcomes. We recommend publishing these studies in journals aimed at the health informatics community, as most current literature on IT-enabled innovation and benefits realization appears in specialized management and IS literature (Waring et al., 2018). Given high levels of investment in HRIS for public services, such studies are likely to prove valuable, both for strengthening the evidence base on HRIS and informing their smooth, timely and effective implementation.

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Availability of Data and Materials

Due to the potential risk of indirect identification, data are available from the authors upon request, pending review of appropriate project stakeholders to ensure participant confidentiality.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical Approval

Level 2 Ethics approval (nonintervention research where you have the consent of the participants and data subjects) was obtained for this study from the University of Edinburgh.

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